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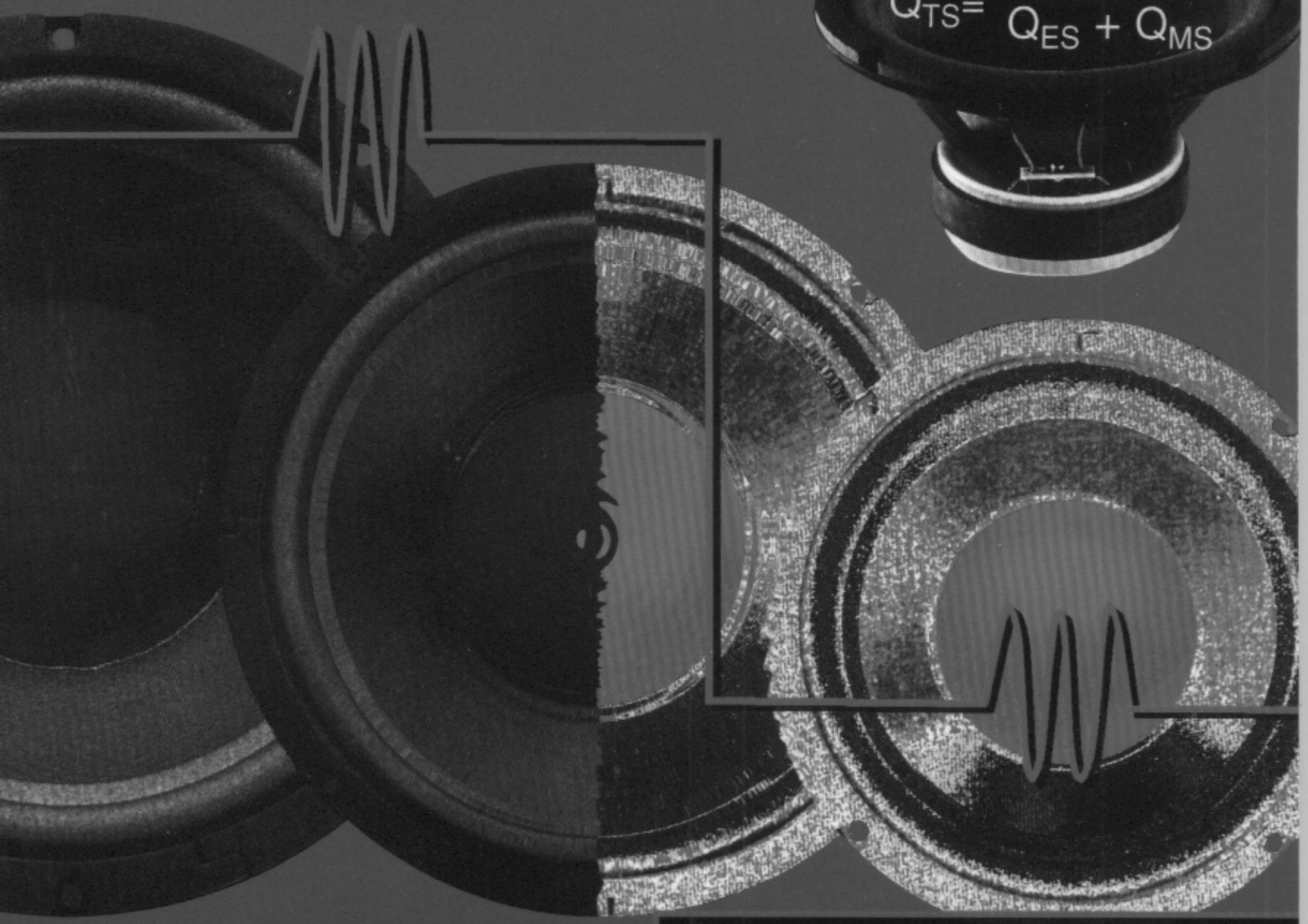
ADVANCED SPEAKER DESIGNS

For the Hobbyist and Technician



Ray Alden

PROMPT® PUBLICATIONS

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NOTE: The author used Radio Shack drivers (Table 4-2 and Table 4-3, pg. 40) when developing this book. Substitution of other drivers that do not have the exact same specifications or measured parameters will produce differing resultant data.

Preface

Advanced Speaker Designs is an outgrowth of a course I taught in speaker building at Stuyvesant High School in New York City. After teaching mathematics for 27 years, the often repeated student statement; "when will I ever use this" began to ring in my ears. It was apparent that there was a virtual absence of any course which applied mathematical abstractions. Many students felt that the only purpose of learning these abstraction was to regurgitate them on the feared math exams. In 1982, with support from the mathematics and industrial arts chairmen, I began a one term course in speaker building. In the first half, the theory was taught and the speakers were designed using mathematics. In the second half, the crossovers and the enclosures were built and the speakers assembled. The students clearly saw that mathematical knowledge could be combined with manual skills to make something they valued. Even other teachers took the course, which continues to this day. Before taking the speakers home, students brought in recorded music. As they listened to the music on their speakers, pride and joy were evident on their faces.

In writing *Advanced Speaker Designs*, I hope to bring the same pride and joy to you every time you play your completed speaker system. Even if you are a novice, with fading memories of high school math, *Advanced Speaker Designs* will help you to become a speaker designer. You may elect to build a speaker system first, by selecting one from Chapter 8, and return later to learn how to build your own unique system. By following instructions using easily available scientific calculators, you will be able to make quick work of complex equations. If you prefer to work on a personal computer, this book also gives tutorials on PC software that both eliminates the need to solve equations and quickly gives many design alternatives. At the same time, the book will give you an intuitive feeling for how speakers work.

The author would like to particularly thank Dr. Joseph D'Appolito for the generous contribution of his time in many discussions regarding topics in this book. Dr. D'Appolito is one of those rare people who simultaneously advances the state of the art and educates the public through his many articles and letters. Considerable thanks are due Diane Alden for the numerous hours in which she helped clarify and edit the original text. Thanks to Elliot Zalayet for many woodworking tips. Thanks also to many current and past colleagues at Stuyvesant High School: Michael D'Alleva, for both taming my unruly computers and taking over the course; Ed Marcantonio, Steve Kramer, Bob Rodney, Sandy Newman, Richard Rothberg and Al Tarendash for support in starting and maintaining the speaker-building course.

Ray Alden, January 1995

INTRODUCTION

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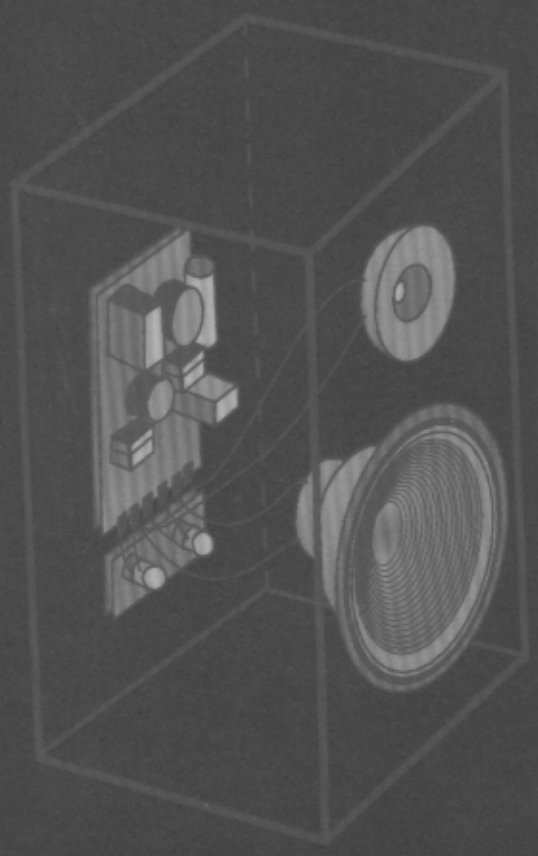
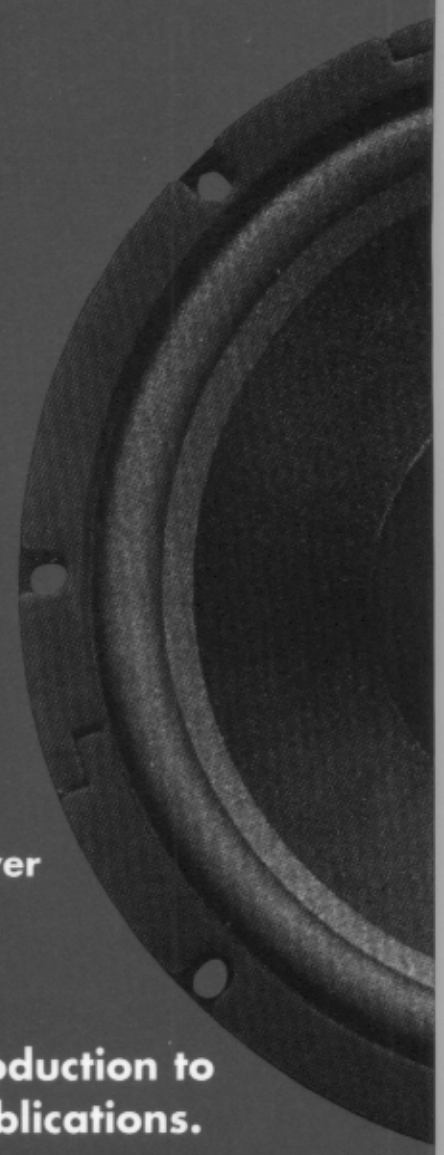
Learn how to design and build your own sophisticated speaker systems with the information contained in this book!

ADVANCED SPEAKER DESIGNS shows the electronics hobbyist and the experienced technician how to create high-quality speaker systems for the home, office, or auditorium. Every part of the system is covered in detail, from the driver and crossover network to the enclosure itself. You can build speaker systems from the parts lists and instructions provided, or you can actually learn to calculate design parameters, system responses, and component values with scientific calculators or PC software. You can also learn how to measure driver parameters and predict system responses for greater precision.



ADVANCED SPEAKER DESIGNS also includes:

- Construction plans for 7 complete systems
- Easy-to-understand instructions and illustrations
- Emphasis on enhanced bass response
- "What-if" variations on existing designs
- Computer-aided speaker design
- Chapters on sealed and vented enclosures
- Subwoofers, crossovers, and driver parameters examined in detail



ADVANCED SPEAKER DESIGNS is a companion book to **SPEAKERS FOR YOUR HOME AND AUTOMOBILE**, an introduction to speakers and speaker system design, from PROMPT Publications.

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